Supplementary Table 1. PERCH Anthropometry Checklist

Staff name: **Date of assessment:** **Assessor initials:**

Weight	**Score** 0 = not done 1 = done	**Score**
Explain procedure to mother and child	0 or 1	
Remove child's shoes & minimize clothing (infants: dry nappies)	0 or 1	
Children ≥2 years: stand still on centre of scale Children <2 years/infants or children who are unable to stand: weigh carer; weigh carer + child; difference = weight of child	0 or 1	
Measure weight to nearest 0.1kg For scales weighing to 2 decimal points: if 0.05kg & above round up; if <0.05kg round down	0 or 1	
Say weight out loud & write it down immediately (check that order of digits is not inverted)	0 or 1	
Show weight to mother & write it in child's health card, if available	0 or 1	
Total score (weight)	**Total** (max = 6)	

Height (children ≥2 years)	**Length** (children <2 years)	**Score** 0 = not done 1 = done	**Score**
Explain procedure to mother and child	Explain procedure to mother and child	0 or 1	
Must have an assistant (can be the mother, if no other staff available)	Must have an assistant (can be the mother, if no other staff available)	0 or 1	
Remove shoes/socks; remove hair ornaments; compress braids	Remove shoes, socks & bulky nappies; remove hair ornaments; compress braids	0 or 1	
Child stands upright in centre of board; hands by side	Child lies supine on the board (must be straight & flat)	0 or 1	
Back of child's head, shoulders, buttocks, calves & heels must touch the backboard	Top of child's head must touch the headboard	0 or 1	
Child's must look forward; direction of gaze is at 90 degrees to vertical plane	Child must look directly upwards; direction of gaze is at 90 degrees to horizontal plane	0 or 1	
Compress abdomen for full height	Soles of both feet MUST be flat against the movable footboard & at 90 degrees to the horizontal plane	0 or 1	
Lower head-board onto top of child's head; read & call out height to nearest 0.1cm	Hold footboard against soles of feet; read & call out length to nearest 0.1cm	0 or 1	
Assistant should record height & show it to measurer for checking	Assistant should record length & show it to measurer for checking	0 or 1	
Show height to mother & write it in child's health card, if available	Show length to mother & write it in child's health card, if available	0 or 1	

Total score (height or length)	**Total** (max = 10)	

Anthropometry checklist (continued)

Mid upper arm circumference (MUAC)	**Score**	**Score**
Explain procedure to mother and child	0 = not done 1 = done	
Identify & fully expose the LEFT arm	0 = right arm 1 = left (correct) arm	
Locate tip of shoulder: raise child's left arm & identify groove of shoulder joint; place your index finger in groove & mark tip of shoulder	0 = wrong technique 1 = correct technique	
With child's left elbow at 90 degrees (palm up), measure distance from tip of shoulder to tip of elbow; if using MUAC tape, the 2 arrows on the tape should be aligned with the tip of the shoulder (=0cm); the mid-point (half the distance between the tip of shoulder & tip of elbow) is then marked on the child's arm	0 = wrong technique 1 = correct technique	
Measurement of MUAC: 1) child's arm hangs down straight; 2) MUAC tape is wrapped round arm directly over the mid-point, with tip of tape passing through slot on right side of window; 3) MUAC tape should rest against the skin (must not compress the tissues or be loose) & MUAC is read at the centre of the window between the 2 arrows; 4) MUAC measurement (to nearest 0.1cm) should be said out loud & written down immediately	Score from 0 to 4 (one point for each step)	
Show MUAC to mother & write it in child's health card, if available	0 = not done 1 = done	
Total score (MUAC)	**Total** (max = 9)	

Anthropometry score	
Score (weight)	
Score (height or length)	
Score (MUAC)	
TOTAL anthropometry score (weight + height or length + MUAC scores) (Max = 25)	
TOTAL % anthropometry score (Total score x 4)	**%**

Supplementary Table 2. PERCH induced sputum (IS) checklist

Staff name: **Date of assessment:** **Assessor initials:**

Procedure	Score
Ask clinician to list the 5 contraindications to IS: 1) convulsion within past 24 hours; 2) inability to protect airway; 3) severe bronchospasm; 4) oxygen saturation <92% for >10 minutes while on supplemental oxygen; 5) clinician considers that child is too sick for IS. Score: 0 to 5 (score one point for each contraindication)	
Child must be nil by mouth for at least 2 hours prior to the start of the IS procedure Score: 0 = no; 1 = yes (Nil by mouth for ≥2 hours)	
Advance preparation: obtain N95 face mask; non-sterile gloves; salbutamol inhaler & spacer or salbutamol nebulizer solution; nebulizer and face mask; hypertonic saline; normal saline flush; container; oxygen source; connecting tubing; suction pump (CHECK it is working); nasogastric (NG) tubes (sizes 6 & 8Fr); sputum trap; pulse oximeter & sensors; respiratory rate timer; laboratory forms; CRF 07*; cool box. Score: 0 = >2 items missing; 1 = 1 or 2 items missing; 2 = no items missing	
Explain procedure to mother; explanation should cover the following 5 points: 1) rationale for doing IS; 2) what will be involved; 3) child will cry but procedure is safe & will not harm the child; 4) mother/assistant should hold child firmly to reduce movement & minimise discomfort; 5) ask mother if she has any questions. Score: 0 = no explanation; 1 = explanation includes 1-3 of the above points; 2 = explanation includes ≥4 of above points	
Attach pulse oximeter (Note**:** pulse oximeter must remain continuously attached to child throughout the IS procedure) & record the following 4 baseline observations: 1) oxygen saturation; 2) oxygen requirement; 3) respiratory rate; 4) AVPU score. Score: from 0 to 4 (score one point for each observation)	
Health & safety: 1) procedure must be carried out in well-ventilated room; 2) put on N95 mask; 3) wash hands (must use soap or antiseptic solution); 4) put on gloves. Score: from 0 to 4 (score one point for each of the above steps)	
Position child in mother's/assistant's arms: Infant or small child: chest to chest; mother's/assistant's left arm round child's body & right hand on his head; **OR** Older child: sitting facing forward on mother's/assistant's lap; mother's/assistant's right arm round arms, and left hand on child's forehead; child's legs held between mother's/assistant's legs. Score: 0 = inadequate positioning ; 1 = secure positioning;	

Administer salbutamol: 1) give 2 puffs (2 x 100 mcg) of salbutamol from metered dose inhaler into spacer; 2) WAIT for 10 seconds or 10 breaths between each puff, and for 5 minutes after second puff. **OR** 1) administer 2.5mg salbutamol solution via nebulizer; 2) WAIT until nebulizer solution has completely disappeared from chamber (full dose given) Score: from 0 to 2 (score one point for each step)	
Administration of hypertonic saline: 1) add 5mls 5% hypertonic saline to nebuliser chamber; 2) position mask correctly on child's face & turn on nebuliser; 3) nebulise for 10 minutes or until all hypertonic saline has disappeared; 4) connect sputum trap via tubing to suction pump. Score: from 0 to 4 (score one point for each of the above steps)	
Gently percuss the chest (5-10 taps on upper and lower quadrants of right & left posterior chest wall) during administration of hypertonic saline, if appropriate. Score: 0 = percussion not done; 1 = percussion performed or not indicated (child >2 years)	
Measure distance to which nasogastric (NG) tube should be inserted: 1) NG tubing should remain in packaging during measurement to avoid contamination or, if unpackaged, must not touch child's face; 2) measure distance from ear lobe to base of nostril. Score: from 0 to 2 (score one point for each of the above steps)	
Obtain specimen: 1) wipe child's nose to remove secretions; 2) extend child's neck slightly; 3) start respiratory rate timer; 4) insert NG tube to full measured distance (must reach the posterior nasopharynx, where resistance should be felt); 5) instruct assistant to apply suction; 6) STOP suction & withdraw catheter when catheter is half filled with secretions or when a maximum of 30 seconds have elapsed (whichever occurs first). Score: from 0 to 6 (score one point for each of the above steps)	
Transfer specimen: 1) place tip of NG tube in 5mls vial of normal saline and apply suction until all the saline has been aspirated; 2) disconnect tubing from specimen container and cap the container tightly; 3) fix pre-printed labels to specimen container; 4) record time that specimen was obtained on the label; 5) place container in cool box for transport to laboratory. Score: from 0 to 5 (score one point for each step)	
Ask clinician to state the 4 times at which post-IS observations (oxygen requirement, oxygen saturation, respiratory rate, AVPU score) should be performed: 1) Immediately after IS; 2) 30 minutes after IS; 3) 2 hours after IS; 4) 4 hours after IS. Score from 0 to 4 (score one point for each)	
Ask clinician to list the 4 events that are considered Serious Adverse Events (SAEs) if they occur within 4 hours of IS (score one point for each): 1) drop in oxygen saturation to <92% for 10 minutes or more, necessitating additional supplemental oxygen; 2) deterioration in AVPU score; 3) new requirement for bronchodilator or increased frequency of bronchodilator treatment; 4) Death Score: from 0 to 4	

Ask clinician to list the 2 clinical indications for stopping IS, and the 1 criterion for subsequently restarting it: 1) Oxygen saturation drops to ≤88% for ≥60 seconds; 2) Oxygen saturation drops to 89-91% for ≥60 seconds despite supplemental oxygen; 3) IS can be restarted if child's clinical condition improves to baseline status Score: from 0 to 3 (score one point for each)	
TOTAL SCORE (maximum = 50)	
Percentage (%) (Total score x 2)	**%**

* CRF 07 (case report form used to detail IS collection procedural steps and specimen collection for PERCH cases).

Supplementary Table 3. PERCH NP/OP swab checklist

Staff name: **Date of assessment:** **Assessor initials:**

Procedure	Score
NP & OP swabs	
Advance preparation: assemble non-sterile gloves, 3 swabs (1 flocked 2 rayon), media (*VTM & STGG), labels, tongue depressor, cool box. Score: 1 = one or more items are missing; 2 = no items are missing	
Explain procedure to mother; this should include the following 5 points: 1) reason for taking NP/OP swabs; 2) what is involved; 3) explain that child will cry but procedure is entirely safe; 4) emphasise importance of holding child firmly to reduce movement & minimise discomfort; 5) ask mother if she has any questions. Score: 0 = no explanation; 1 = explanation includes 1 to 3 of the above points; 2 = explanation includes 4 or more of the above points.	
Position child in mother's/assistant's arms: Infant or small child: chest to chest, mother's/assistant's left arm round child's body & right hand on his head. Older child: sitting facing forward on mother's/assistant's lap; mother's/assistant's right arm round child's arms & left hand on child's forehead; child's legs held between mother's/assistant's legs Score: 0 = inadequate positioning ; 1 = secure positioning	
Wash hands & put on gloves Score: 0 = one or none; 1 = both	
NP swab	
Measure insertion distance: 1) Flocked swab must remain in packaging during measurement; 2) measure distance from tragus (front) of ear to base of nostril (if child has nasal discharge this should be wiped away with a tissue) Score: from 0 to 2 (score one point for each step)	
Insert NP swab: 1) Swab should be held between thumb & index finger; 2) Insert swab into medial side of nostril (alongside the nasal septum); 3) Swab should remain horizontal throughout insertion (i.e. parallel to the hard palate); 4) Insert swab to full measured length (NOT just 1-2cm) Score: from 0 to 4 (score one point for each step)	
Take sample: When swab is fully inserted, rotate 180 degrees to right and left and remove immediately Score: 0 (not done) or 1	
Transfer swabs to media: 1) First NP swab is placed in VTM; 2) Second NP swab in STGG (check lid closure); 3) Both samples must be labelled; 4) Samples are placed in cool box or fridge. Score: from 0 to 4 (score one point for each step)	
OP swab	
MUST use tongue depressor (spatula) to visualise tonsils Score: 0 (tongue depressor NOT used) or 1 (tongue depressor used)	
Take samples: 1) Touch both tonsil beds and posterior oro-pharynx with swab, rotating swab 180 degrees to right and left; 2) Place OP swab in same tube of VTM as first NP swab. Score: from 0 to 2 (score one point for each step)	
TOTAL SCORE (maximum = 20)	

% score (total score x 5)	**%**

*VTM = viral transport medium; STGG = skim milk-tryptone-glucose-glycerin medium (bacterial transport medium).

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